BEAVER CREEK WATERSHED DAM



EAP

EMERGENCY ACTION PLAN

BEAVER CREEK WATERSHED DAM

EAP

(EMERGENCY ACTION PLAN)

Hill County Commissioners Hill County Courthouse 315 4th Street Havre, Montana 59501

Updated March 1, 2011

If Beaver Creek Dam is failing or failure seems imminent, call:

All Emergencies	911	
Hill County Sheriff		
Disaster and Emergency Services		Work Home



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I. INTRODUCTION:

- 1. Purpose; The purpose of this emergency action plan (EAP) is primarily to safeguard the lives and secondarily to reduce property damage of the citizens of Hill County, living along Beaver Creek and Milk River in the event of flooding caused by a failure of Beaver Creek Dam.
- 2. Description of Dam; Beaver Creek Dam is in Hill County, S1/2 of Section 25, Township 31N, Range 15E and located on Beaver Creek, tributary to the Milk River. It is owned by Hill County, 315 4th Street, Hill County Courthouse, Havre, Montana 59501, and is used for irrigation, flood control, and recreation purposes. Technical data pertaining to Beaver Creek Dam is listed in Appendix C and structures are shown in Appendix D.
- Access to Dam; Beaver Creek Dam is located one half mile off Secondary Highway 234, approximately 8 miles south of Havre. As shown on the inundation map (B-1) only one county road accesses the lake facilities. The nearest phone is located at the residence of Charles Manuel, 395-4749, west of the dam and Bernie Golie, 395-4145, east of the dam.
- 4. Hazard Area; the evacuation area extends for approximately nine (9) miles along Beaver Creek. State Highway 87 along with at least 50 residential units and

several businesses are located in the possible inundation area. Inundation and evacuation maps are located in Appendix B-1 of this plan.

- Safety Act, Chapter 15 of Title 85, the dam owner is responsible for production, coordination, maintenance, and implementation of this emergency action plan.

 Extent of owner implementation was defined through coordination of this plan with the county sheriff and disaster and emergency services coordinator.
- 6. Periodic Review/Updating; the owner will review and update this EAP annually. Review/update by a professional engineer will be accomplished as required by the dam's operation permit, but no less than every five years.
- 7. Approval; By my signature, I acknowledge that I, or my representative have reviewed this plan, and agree to the tasks and responsibilities assigned herein for my department and/or agency.

ON FILE		ON FILE		
Signature	Date	Signature	Date	
HILL COUNTY	SHERIFF'S OFFICE	DISASTER AND EMERGENCY	SERVICES	

II. NOTIFICATION PROCEDURES:

A. FAILURE IS IMMINENT OR HAS OCCURRED;

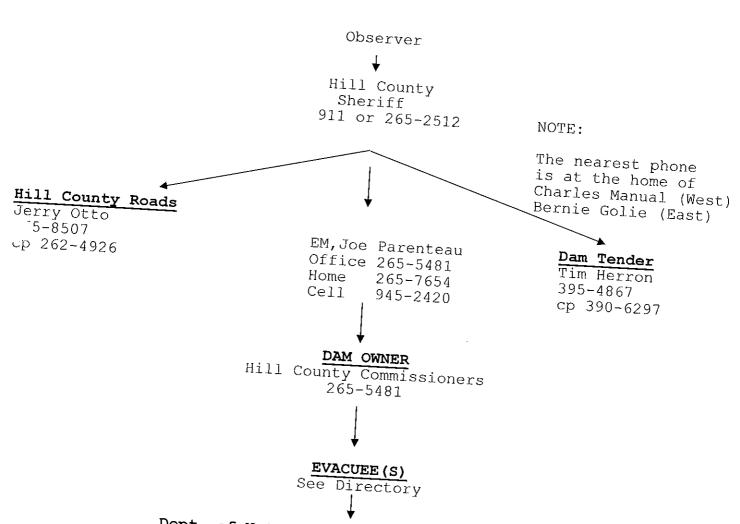
If Beaver Creek Dam is failing, two things must be undertaken immediately: (1) the hazard area downstream from the dam must be evacuated, and (2) any steps that might save the dam or reduce damage to the dam or hazard area should be taken. (Refer to the map in Appendix B to determine the areas that are likely to be inundated if the dam fails). The evacuation will be handled according to the county warning plan.

BEAVER CREEK WATERSHED DAM

IMMINENT FAILURE

"NOTIFICATION FLOWCHART"

Emergency Condition



Dept. of Natural Resources & Conservation

Dam Safety Section

Michele Lemieux: w/p: 444-6613 c/p: 459-3572

WHAT THE DAM OWNER SHOULD DO:

As dam owner, it is your responsibility to:

- a. Call the Sheriff's Dispatch Center (911 or 265-2512) and Disaster and Emergency Services (265-5481 Ext. 283). Be sure to say, "This is an emergency". They will call other authorities and the media and begin the evacuation.
- b. Do whatever is necessary to bring anyone in immediate danger (someone on the dam, or directly below the dam, or boating on the reservoir, or evacuees if directed by the sheriff) to safety.
- c. Keep in frequent touch with Disaster and Emergency Services. They will tell you how to handle the emergency.
- d. If all means of communication are lost: (1) try to find out why, (2) try to get to another radio or a telephone that works, or (3) get someone else to try to re-establish communications. If these means fail, handle the immediate problems as well as you can, and periodically try to reestablish contact with Disaster and Emergency Services.
- e. It is important that you accurately judge whether the dam is about to fail. If you are not sure whether the dam is threatened, seek advice from a qualified

engineer or call the Department of Natural Resources and Conservation Dam Safety Section (406-444-6646).

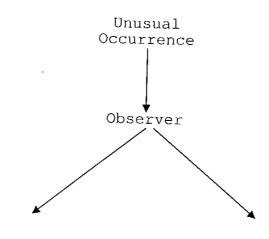
B. POTENTIALLY HAZARDOUS SITUATION IS DEVELOPING:

A potentially hazardous situation is an event or condition not normally encountered in the routine operation of the dam and reservoir. Among the unusual occurrences that may affect the dam are dam embankment problems, failure of the spillway or outlet works, heavy precipitation or rapid spring snowmelt, landslides, earthquakes, erosion, theft, vandalism, acts of sabotage, and serious accidents. These occurrences may endanger the dam, the public, or the downstream valley and may necessitate a temporary or permanent revision of the dam's operating procedures.

BEAVER CREEK WATERSHED DAM

UNUSUAL OCCURRENCE

"NOTIFICATION FLOWCHART"



Hill County Commissioners 265-5481

Hill County Roads Jerry Otto 265-8507 cp 262-4926

Emergency Management

Sheriff

265-2512

911

Joe Parenteau Office: 265-5481 Home: 265-7654 Cell: 945-2420

Local Engineers DNRC

Marvin Cross 265-5516 (w) 265-9095 (h)

Dept Nat'l Resource

Dam Safety

Michelle Lemieux Office: 444-6613 Cell: 459-3572

Laurence Siroky Office: 444-0456 Home: 442-2806

NRCS 265-6252

Dam Tender

Tim Herron 395-4867 390-6297 (c)

2. WHAT THE DAM OWNER SHOULD DO:

If you discover an unusual condition of the dam embankment that could threaten the structure:

- a. Have a qualified engineer inspect the dam as soon as possible to determine whether emergency action is necessary.
- b. Notify the county Disaster and Emergency Services Coordinator of the potential problem.
- c. Contact the Department of Natural Resources and Conservation (DNRC) Dam Safety Section.
- 3. Among the conditions you should watch for are: overtopping of the dam by flood waters; loss of material from the dam crest due to storm wave erosion; slides on either the upstream or downstream slope of the embankment as evidenced by sloughing, cracking, bulging, or scarping of the embankment; erosional flows through, beneath, or around the embankment as evidenced by excessive seepage, discolorment of the seepage, boils on the downstream side, sinkholes, changes in piezometer levels or changes in the flow from drains; failure of outlets or spillways due to clogging or erosion; movement of the dam on its foundation as evidenced by misalignment, settlement, or cracking; or loss of

abutment support as evidenced by cracking in concrete dams.

4. When you call either an engineer or the DNRC to report a problem, use the form in Appendix A to ensure you can provide sufficient information for the engineer to analyze the problems. In addition, prepare a sketch showing the extent of the problem. Revise the sketch periodically if the problem develops further. Section III includes further guidelines for courses of action to take to mitigate the effect of many problems.

C. POSTING THE NOTIFICATION FLOWCHART AND DISTRIBUTION OF THE EAP:

The notification flowchart is posted at the dam and a copy of the EAP is in the gatehouse. The Hill County Sheriff's Office and the Hill County DES Coordinator have copies of the plan.

A. PRIORITY ONE

1. SHERIFF:

Hill County (24 hour service)......911 or 265-2512

2. DISASTER & EMERGENCY SERVICES:

Hill County......Office: 265-5481 Ext.283
Montana Disaster & Emergency Services, Helena.....444-6911

3. <u>EVACUEES</u>:

J. EVACUEES:			
Jim Vosen	395-4293	Betty Vosen	205 4002
Donna Patrick	945-1674	Dia Arpon	395-4293
Ft.Assiniboine	265-6115	Ryan Lamer	265-7831
Malcolm McLean	265-4468	Jon/Bobbie Davis	265-4706
Matt Kretchmer	265-2454	Phillip Moen	945-3878
John Rosenbaum	265-5009	John Ramsdell	265-2905
Edward Ruff	265-3455	Larry Fangsrud	0.05
	cp 390-1574	Don Vaupel	265-2031
Stephen Renaker	265-6456	O'Donnell Zeigler	265-7514
Allan LaBuda	265-2739	Sharon Zeigler	265-4008
Roger Hinckley	265-8228	Brian Schaub	265-4038
Cp 399-0720 399-0721	399-0688	Marvin Neufeld	262-9972
Ron/Valerie Smith	265-8611	Mark Magelssen	265-5715
Mary Wells	265-6296	Randal Anderson	265-1352
Jean Skinner	265-2911	David Williams	265-2770
Raymond Staples	265-2634	Patricia Childs	265-8484
Terry Dockter	265-7319	Earl Nelson	265-4030
Douglas Erhard	265-2924	Richard Czech	265-2695
Jeff Moffitt	265-6396	Mark Mayer	265-5085
Jean Armstrong	265-4095	Marvin Kafka	265-1043
Michael L. Bailey	265-4281	Robert Hoover	265-9201
Marcel Thiel	265-6414	Doug Solomon	265-9447
Robert Vukasin	265-7136	Gary Michaels	265-3467
James Bachini	265-2485	Kenneth Washman	265-6462
Ray Hoover	265-8025	James Golden	265-2349
Kent Gilge	262-9755		265-6963
Roy Mayer	265-4846	Peggy Mahle Pamela Kuhn	
Ken/Helen Frank	265-2998	Peter Steinmetz	262-2190
Joe Seidel	265-6682	Michael Nolan	265-2926
Golf Course	265-7861	David Otto	265-1777
Delmar Ruff	265-8266	Marian Dumas	265-2918
Paul Huston	265-2941	Terry Stoppa	265-3329
Scott Lucke	265-4063	Gary Richardson	265-4870
Bill Kuhn	265-9395	Wm Oven	265-4246
Patrick Construction	265-3351	John Benjamin	395-4293
Robert Flesche	265-1301	Tarry Richardson	265-2526
Lorraine K. Hanson	265-5344	Allan Otto	265-1653
James R. Sisty	399-3049	MITAIL OCCO	265-5154

Those individuals contacted shall be asked to inform their neighbors of the current situation to insure that everyone will be notified. Revised March, 2011

4.	LOCAL ENGINEERS:		
	DNRC Regional	265-5516 265-9095 265-6252	
5.	MONTANA DEPT. OF NATURAL RESOURCES AND CONCEDUATION	(DNRC):	
	Mr. Laurence Siroky, Bureau ChiefOffice: Michele Lemieux, Dam Safety ProgramOffice:	444-0860 444-6816 444-6613	
	Cell: Dam Safety Specialist, Chad NewmanOffice: CAP Coordinator, Tracy Sears-TullOffice:	459-6613 444-9362 444-6654	
6.	NATIONAL WEATHER SERVICE Great Falls Billings Glasgow	CEO OOC1	
7.	MONTANA DEPARTMENT OF FISH, WILDLIFE, AND PARKS (DF Havre Office		
	Design and Construction Bureau. Mr. Joe Maurier, Director. Mr. Paul Valle Construction Bureau.	.841-4013	
8.	DAM TENDER:		
	Mr. Tim Herron	395-4867 390-6297	
9.	MONTANA DEPARTMENT OF TRANSPORTATION: Mr. Tony Strainer		
	The state of the s	262-5500 262-4393	
10.	NORTHERN MONTANA HOSPITAL:	265-2211	
11.	KOJM/KPQX/KRYK Radio Station:	265-7841	
Revised: March, 2011			

III. MITIGATION ACTIONS:

Besides normal monitoring of the dam's condition which is done at least monthly, the owner will provide continuous monitoring and inspection during and after extreme events

such as storms and earthquakes. The magnitude of an earthquake or storm can be obtained from the DNRC Dam Safety, 444-6601. Actions suggested to mitigate problems that develop should never be continued at the risk of injury or at the expense of lessening efforts related to evacuation. Monitoring should identify any of the following potential problems.

A. POTENTIAL PROBLEMS / IMMEDIATE RESPONSE ACTIONS:

1. OVERTOPPING BY FLOOD WATERS:

- a. Open outlet to its maximum safe capacity.
- b. Place sandbags along the crest to increase freeboard and force more water through the spillway and outlet.
- c. Provide erosion-resistant protection to the downstream slope by placing plastic sheets or other materials over eroding areas.
- d. Divert flood waters around the reservoir basin if possible.
- e. Create additional spillway capacity by making a controlled breach in a low embankment or dike section where the foundation materials are erosion resistant.

2. LOSS OF FREEBOARD OR DAM CROSS SECTION DUE TO STORM/ WAVE EROSION:

- a. Place additional riprap or sandbags in damaged area to prevent further embankment erosion.
- b. Lower the water level to an elevation below the

damaged area.

3. SLIDES IN THE UPSTREAM OR DOWNSTREAM SLOPE OF THE EMBANKMENT:

- a. Lower the water level at a rate and to an elevation considered safe given the slope condition. If the outlet is damaged or blocked, pumping, siphoning, or a controlled breach may be required.
- b. Stabilize slides on the downstream slope by weighting the toe area with additional soil, rock, or gravel and then restore lost freeboard by placing sandbags at crest.

4. EROSIONAL FLOWS THROUGH THE EMBANKMENT, FOUNDATION, OR ABUTMENTS:

- a. Plug the flow with whatever material is available (hay bales, bentonite, or plastic sheeting if the entrance to the leak is in the reservoir basin).
- b. Lower the water level until the flow decreases to a non-erosive velocity or until it stops.
- c. Place protective sand and gravel filter or boil ring over the exit area to hold materials in place.

5. FAILURE OF APPURTENANT STRUCTURES SUCH AS OUTLETS OR SPILLWAYS:

- a. Implement temporary measures to protect the damaged structure, such as closing an outlet or providing temporary protection for a damaged spillway.
- b. Lower the water level to a safe elevation. If the outlet is inoperable, pumping, siphoning, or a controlled breach may be required.

6. MASS MOVEMENT OF THE DAM ON ITS FOUNDATION, (SPREADING OR MASS SLIDING FAILURE):

- a. Immediately lower the water level until excessive movement stops.
- 7. EXCESSIVE SEEPAGE AND HIGH LEVEL SATURATION OF THE

EMBANKMENT:

- a. Lower the water to a safe level.
- b. Continue frequent monitoring for signs of slides, cracking or concentrated seepage.

8. SPILLWAY BACKCUTTING THREATENING RESERVOIR EVACUATION:

- a. Reduce the flow over the spillway by fully opening the main outlet.
- b. Provide temporary protection at the point of erosion by placing sandbags, riprap materials, or plastic sheets weighted with sandbags.
- c. When the inflow subsides, lower the water to a safe level.

9. EXCESSIVE SETTLEMENT OF THE EMBANKMENT:

- a. Lower the water level by releasing it through the outlet or by pumping, siphoning, or a controlled breach.
- b. If necessary, restore freeboard, preferably by placing sandbags.

10. LOSS OF ABUTMENT SUPPORT OR EXTENSIVE CRACKING IN CONCRETE DAMS:

- a. Lower the water level by releasing it through the outlet.
- b. Attempt to block water movement through the dam by placing plastic sheets on the upstream face.

B. EMERGENCY SUPPLIES AND RESOURCES:

Soils in the vicinity of Beaver Creek Dam are mostly glacial to lean clay which has been shown to be suitable fill for repair materials in an emergency.

C. LOCAL CONTRACTORS AND ENGINEERS:

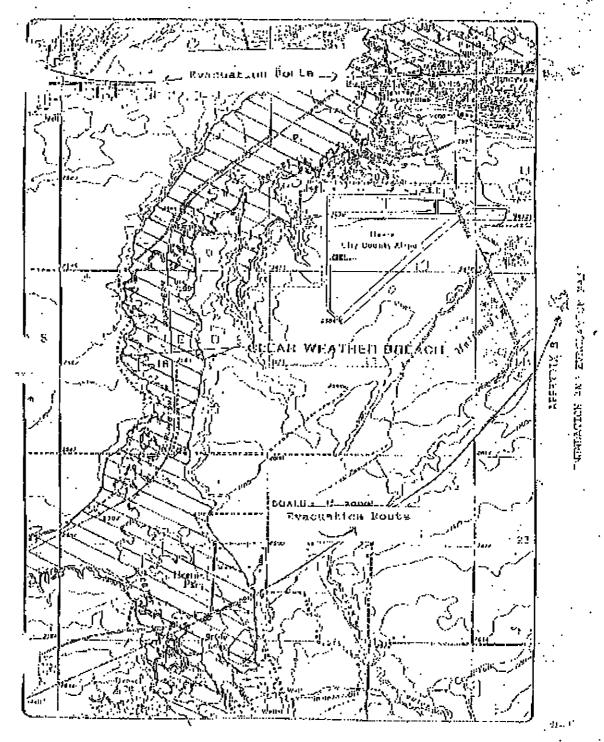
Baltrusch Construction	w/p 265-5488	c/p 265-0040
Patrick Construction	w/p 265-3351	c/p 262-3015
Lakeside Construction	w/p 265-9401	
Rock Solid Enterprises	w/p 265-6703	c/p 262-3049
Hill County Road Dept.	w/p 265-8507	c/p 262-4926

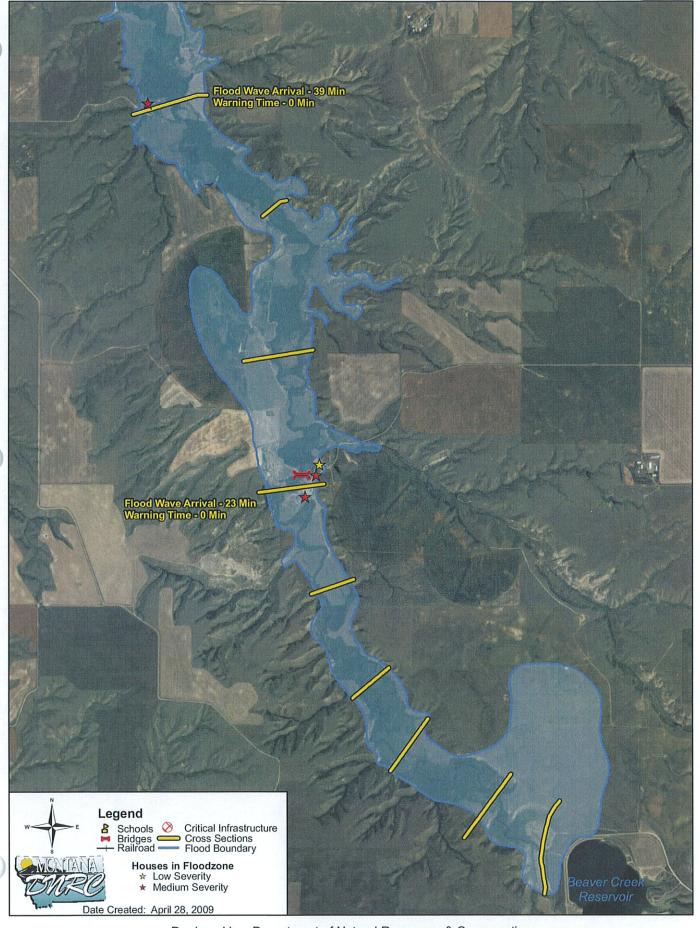
APPENDIX A

BEAVER CREEK DAM INCIDENT REPORT FORM

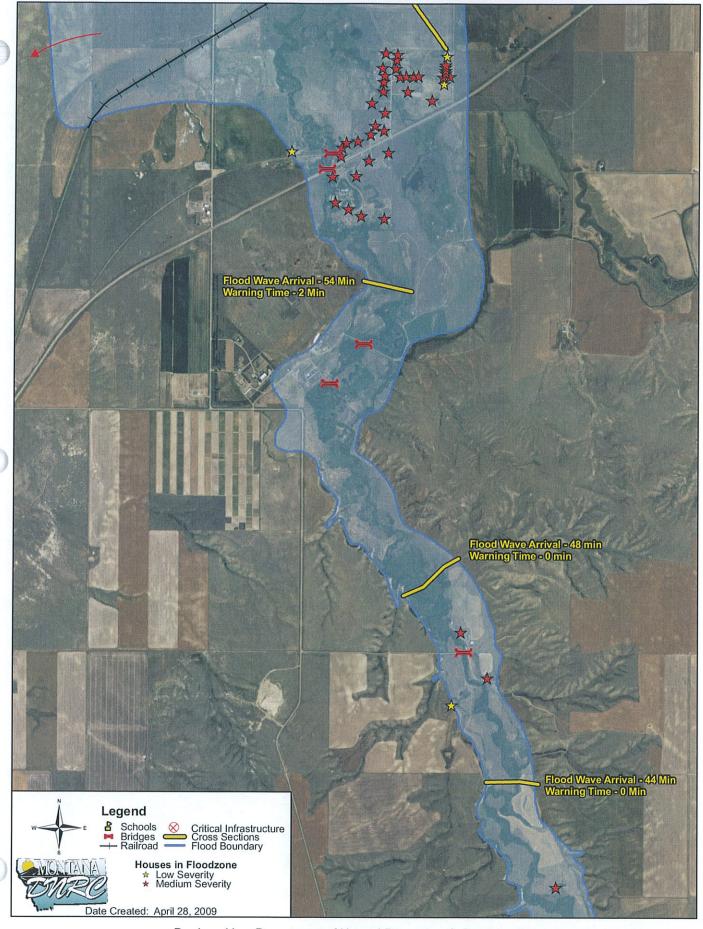
DATE:	TIME:
	(looking downstream):
	NS:
	A-1

APPENDIX 3

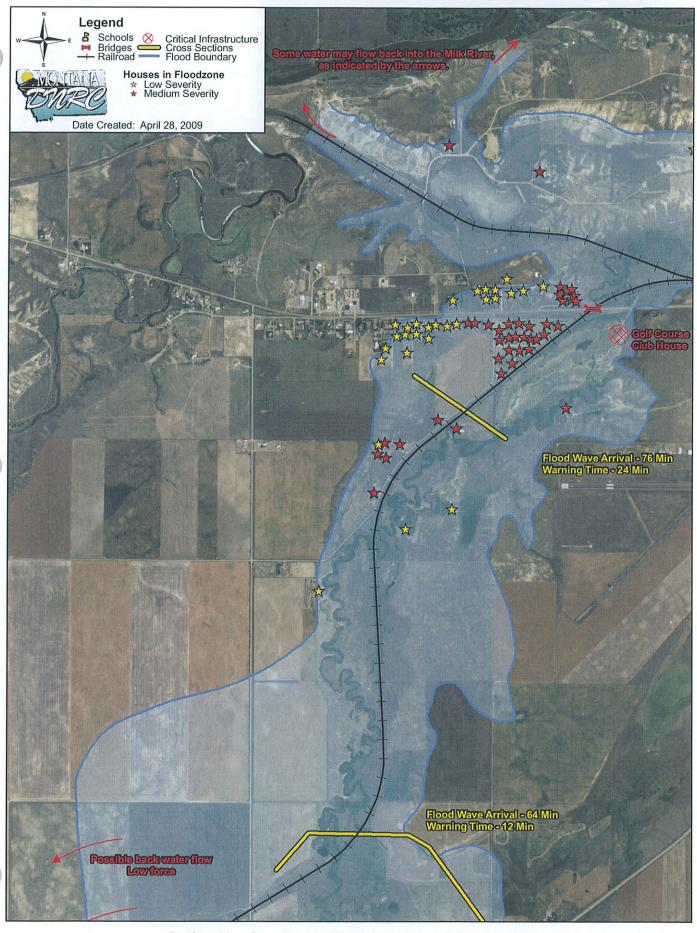




Produced by: Department of Natural Resources & Conservation



Produced by: Department of Natural Resources & Conservation



Produced by: Department of Natural Resources & Conservation

Produced by: Department of Natural Resources & Conservation

1,000

Beaver Creek Dam F ure Evacuation Map

Scale

Beaver Creek Dam Foure Evacuation Map

Scale 3,000

Produced by: Department of Natural Resources & Conservation

APPENDIX C

BEAVER CREEK DAM TECHNICAL DATA

Max reservoir capacity to the crest of the dam	8,700 acre feet
Normal reservoir capacity measured to the emergency spillway crest	6,270 acre feet
Emergency spillway crest elevation	3,091.5 feet
Normal height measured from streambed to crest of the dam	108 feet
Length of dam crest	2,900 feet
Outlet capacity	820 cfs
Spillway capacity	1,400 cfs
Construction date	1974
Peak discharge	18-27,000 cfs

